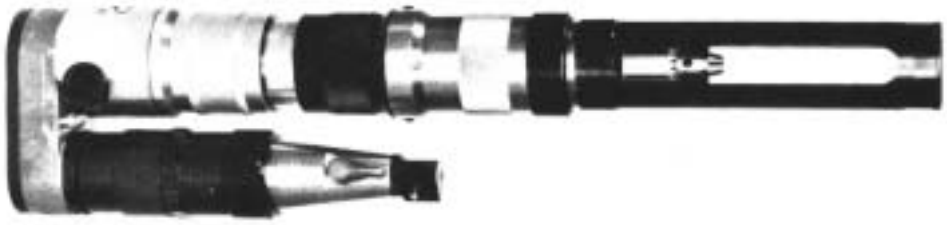
COOPER Tools

Operation & Service Manual
823120 **1/02**

Quackenbush®

158QGDB-RF-S400 BACK SPOT FACER POSITIVE FEED DRILL



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7007 Pinemont
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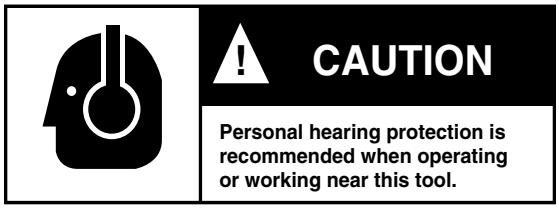
Safety Recommendations

For your safety and the safety of others, read and understand the safety recommendations and operating instructions before operating any drill motor.

Always wear protective equipment:

For additional information on eye and face protection, refer to Federal OSHA Regulations, 29 Code of Federal Regulations, Section 1910.133., Eye and Face Protection, and American National Standards Institute, ANSI Z87.1, Occupational and Educational Eye and Face Protection. Z87.1 is available from the American National Standards Institute, Inc. 11 West 42nd Street, New York, NY 10036.



Hearing protectors are required in high noise areas, 85 dBA or greater. The operation of other tools and equipment in the area, reflective surfaces, process noises and resonant structures can substantially contribute to, and increase the noise level in the area. For additional information on hearing protection, refer to Federal OSHA Regulations, 29 Code of Federal Regulations, Section 1910.95, Occupational Noise Exposure, and American National Standards Institute, ANSI S12.6, Hearing Protectors.

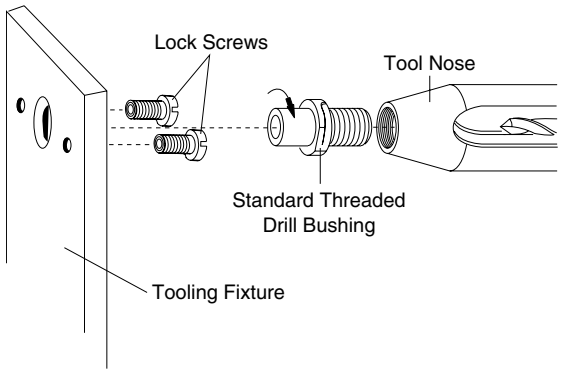
Follow good machine shop practices. Rotating shafts and moving components entangle and entrap, and may result in serious injuries. Never wear long hair, loose-fitting clothes, gloves, ties, or jewelry when working with or near a drill of any type.

Quackenbush drills are designed to operate on 90psig (6.2 bar) maximum air pressure using the proper hose. Excessive air pressure increases the loads and stresses on tool parts and drills, and may result in breakage. The installation of a filter-regulator-lubricator in the air supply line ahead of the tool is highly recommended.

CAUTION

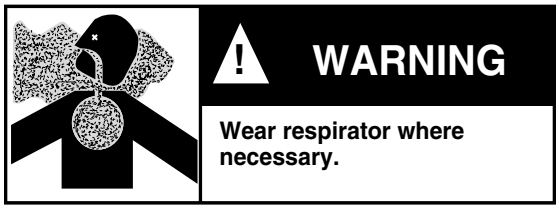
- Before the tool is connected to the air supply, the throttle should be checked for proper operation (i.e., throttle valve moves freely and returns to closed position).
- Before removing a tool from service or changing drill bits, make sure the air line is shut off and drained of air. This will prevent the tool from operating if the throttle is accidently engaged.
- Cutting tools used with these drill motors are sharp. Handle them carefully to avoid injury.

CAUTION Before mounting any positive feed drill, check the lock screws in the tooling fixture and drill bushing. Make sure both are in good condition and securely tightened.



Positive feed drills can exert high torques and high thrust loads. If failure of the lock screws or drill bushing occurs, the drill may suddenly spin and back away from the drill fixture.

Always remove chuck key or drill drift before operating tool.



Drilling or other use of this tool may produce hazardous fumes and/or dust. To avoid adverse health effects utilize adequate ventilation and/or a respirator. Read the material safety data sheet of any cutting fluids or materials involved in the drilling process.

CAUTION Some non-ferrus metal chips (or dusts) are combustible. Examples: Aluminum, magnesium, Titanium, and Zirconium. See the material safety data sheets for combustibility of materials drilled. Never collect spark generating material with combustible material. Examples: Collecting both steel and aluminum or steel and titanium.

Safety Recommendations

CAUTION

Slip and fall hazard.
- Lubricant and coolant systems must be properly maintained to avoid leakage.
- Hoses must be organized and care taken to avoid tripping.

Quackenbush drills are often used with lubricant or cooling systems which must be properly maintained to avoid leakage. Failure to do so can result in serious injuries from slipping on oily surfaces.

Nose pieces usually used with these drills are generally slotted for visibility and access to chuck and cutter.

WARNING

Keep hands and fingers away from slot in tool nose when handling or operating tool.

Keep fingers and hands away from slots in the tool nose at all times. Rapid spindle retraction occurs automatically on most models after drilling cycle and can be activated manually even with the air supply disconnected on some models.

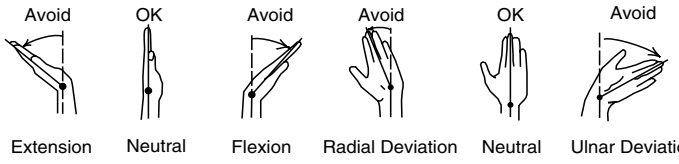
CAUTION

Due to the multitude and variety of tooling applications, the User's Methods Engineering, Standard Tooling Engineering, and/or Safety Engineering Departments, etc., must consider any hazards that may be associated with each specific application of this product and provide adequate operator protection from inadvertent contact with any moving components.

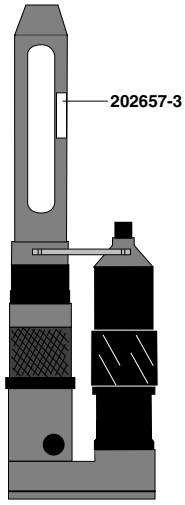
Some individuals are susceptible to disorders of the hands and arms when exposed to vibration and/or tasks which involve repetitive work motions. Those individuals predisposed to vasculatory or circulatory problems may be particularly susceptible. Cumulative trauma disorders such as carpal tunnel syndrome and tendinitis may be caused or aggravated by repetitious, forceful exertions of the hands and arms. These disorders develop gradually over periods of weeks, months, and years. Tasks should be performed in such a manner that the wrists are maintained in a neutral position, which is not flexed, hyperextended, or turned side to side. Stressful postures should be avoided and can be controlled through tool selection and work location.

Any tool operator should be aware of the following warning signs and symptoms so that a problem can be addressed before it becomes a debilitating injury. Any user suffering from prolonged symptoms of tingling, numbness, blanching of fingers, clumsiness or weakened grip, inability to hold objects, nocturnal pain in the hand, or any other disorder of the shoulders, arms, wrists, or fingers should notify their employer so that a review of what steps might be taken to prevent further occurances. These steps might include but are not limited to, repositioning the workpiece or redesigning the workstation, reassigning tool users to other jobs, rotating jobs, changing worker pace, and/or changing the type of tool used so as to minimize stress on the operator. Some tasks may require more than one type of tool to obtain the optimum operator/ tool/ task relationship.

The following recommendations will help reduce or moderate the effects of repetitive work motions. The operator of any drill should:
- Use a minimum hand grip force consistent with proper control and safe operation
- Keep body and hands warm and dry
- Avoid anything that inhibits blood circulation
  - — Smoking Tobacco
  - — Cold Temperatures
  - — Certain Drugs



- Avoid awkward postures
- Keep wrists as straight as possible
- Interrupt work, activities, or rotate jobs to provide periods free from repetitive work motions.



Safety Labels

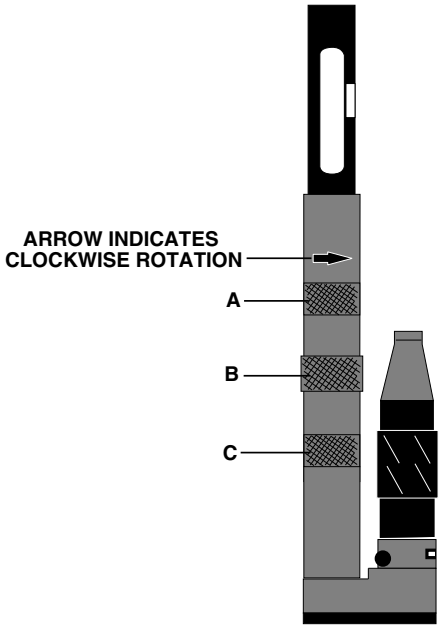
The safety labels found on these tools are an essential part of this product. Labels should not be removed. Labels should be checked periodically for legibility. Replace safety labels when missing or when the information can no longer be read. Safety labels should always be placed on any tool nose before installing on tool. Replacement labels can be ordered using number below.

OPERATION

The 158QGDB-RF-S400 Back Spot Facer is designed to operate on 90 P.S.I. It will operate satisfactorily on a 3/8" hose up to 8' in length. If additional hose is needed, a 1/2" or larger hose may be attached to the 3/8" hose. Spindle travel in this tool is towards the operator. This makes spot facing of difficult hole locations possible with a positive mechanical feed tool in formerly inaccessible spots. The feed is actuated by rotating the feed collar. The spindle may be returned to the starting position at any time during the feed cycle. At the end of a cycle, the spindle will automatically return to its starting position.

OPERATING INSTRUCTIONS

Three rotatable collars **A**, **B** and **C** control the adjustment and operation of the drill.



Collar **A** (Forward Stroke Adjustment) adjusts the retracted position of the spindle.

Collar **B** manually starts reward motion of the spindle, and manually retracts the spindle.

Collar **C** (Reward Stroke Adjustment) limits reward motion of spindle, and automatically retracts the spindle.

ADJUSTMENT AND OPERATION

Lock unit into drill fixture. Turn collar **B** clockwise, disengaging positive feed mechanism

Rotate collar **A** counterclockwise, advancing drill tip close to the work.

Start motor, and rotate collar **B** counterclockwise maintaining steady pressure on collar until feed mechanism is engaged, starting drilling operation. The operation can be stopped at any time by rotating collar **B** clockwise, disengaging positive feed mechanism and retracting spindle.

To adjust unit for depth control rotate collar **C**. (Clockwise rotation increases length of stroke.) On retraction of spindle rotate collar **B** clockwise allowing it to move back longitudinally resetting feed mechanism.

LUBRICATION

An automatic in-line filter-lubricator is highly recommended. This will supply the tool with clean, lubricated air; keep it in sustained operation; and increase tool life.

The in-line lubricator should be regularly checked and filled with a good grade of 10W machine oil. In the event an in-line lubricator is not used, the tool should be disconnected from the air supply several times daily and several drops of oil poured into the tool's air inlet bushing.

DISASSEMBLY

To disassembly the tool, loosen the lock nut No. 619421 and remove the complete motor unit. Remove the tool nose (Left Hand Threads), nose adaptor No. 619464 (Left Hand Threads), then remove the drill chuck and adaptor No. 619400. Remove the snap ring No. 619398 and unscrew the retract stop collar No. 619696 (Left Hand Threads). This will allow the two (2) return stops No. 619387 to be removed from the shaft housing No. 619693. Remove the snap ring No. 619398 and unscrew the two set screws No. 619431. After removing the screw No. 619384 rotate the feed collar No. 619698 past the cam section and pull it off towards the front, being careful not to lose either the steel ball No. 842274 or the spring No. 613048. After removing the half nuts, the stop collar No. 619697 may be unscrewed. This will permit the two feed stops No. 61 9418, spring No. 619394 and the spring cover No. 619695 to be removed. By removing the set screw No. 619465, the bearing retainer No. 619614 (Left Hand Threads) may be removed. The extension spindle with associated parts can now be removed. The shaft housing No. 619693 (Left Hand Threads) may now be removed from the gear body No. 619363. Remove the gear cover screws and remove the gear cover No. 619415. This will allow the spindle gear, gear spacer No. 619403, and idler gear to be removed. The drive shaft with mating parts can now be removed through the rear of the tool. Remove the three gear housing bolts and pull the gear housing No. 619742 from the gear body. Remove the snap ring No. 843179 from the lead screw driver through the rear of the gear body and press the lead screw driver from the ball bearing No. 864471 . To remove the cross shaft No. 619403, remove the two retainer rings and plugs. Pressing on the cross shaft, press the cross shaft with mating parts out through the side with the larger opening. Remove the snap ring No. 619016 and press the pinion shaft No. 619382 out the rear of the gear body. The various assemblies can be broken down into their individual components for inspection and replacement of parts if necessary.

To disassemble the motor unit, clamp it in a vertical position in a soft jawed vise on the flats on the No. 613275 motor housing and unscrew the internal gear No. 613285 from the housing. The planet cage No. 613284 with attached components can be removed through the rear of the internal gear. Using a suitable bearing puller, the rear planet bearing No. 613281 can be removed. Clamp the planet cage in a vise and unscrew the motor gear (LEFT HAND THREADS), to remove the front planet bearing No. 864471 and No. 613278 planet cage washer. This will allow the planet pins No. 613279 and planet wheels No. 613280 to be removed for inspection. To remove the motor unit, invert the tool and loosen the No. 613283 handle nut and remove the No. 611233 handle assembly. The complete motor can now be gently shipped out through the rear of the motor housing.

Clamp the exposed end of the rotor shaft lightly in a soft jawed vise and unscrew the governor (LEFT HAND THREADS) NOTE: The governor should not be disassembled as it may be ordered as a subassembly only. The rear bearing plate No. 613241, cylinder No. 613225, rotor No. 613234, and rotor blades can now be removed. Remove the No. 843618 rotor bearing snap ring and remove the No. 613274 rotor shaft. When removing the No. 613294 rotor bearing retainer from the front bearing plate it has (LEFT HAND THREADS).

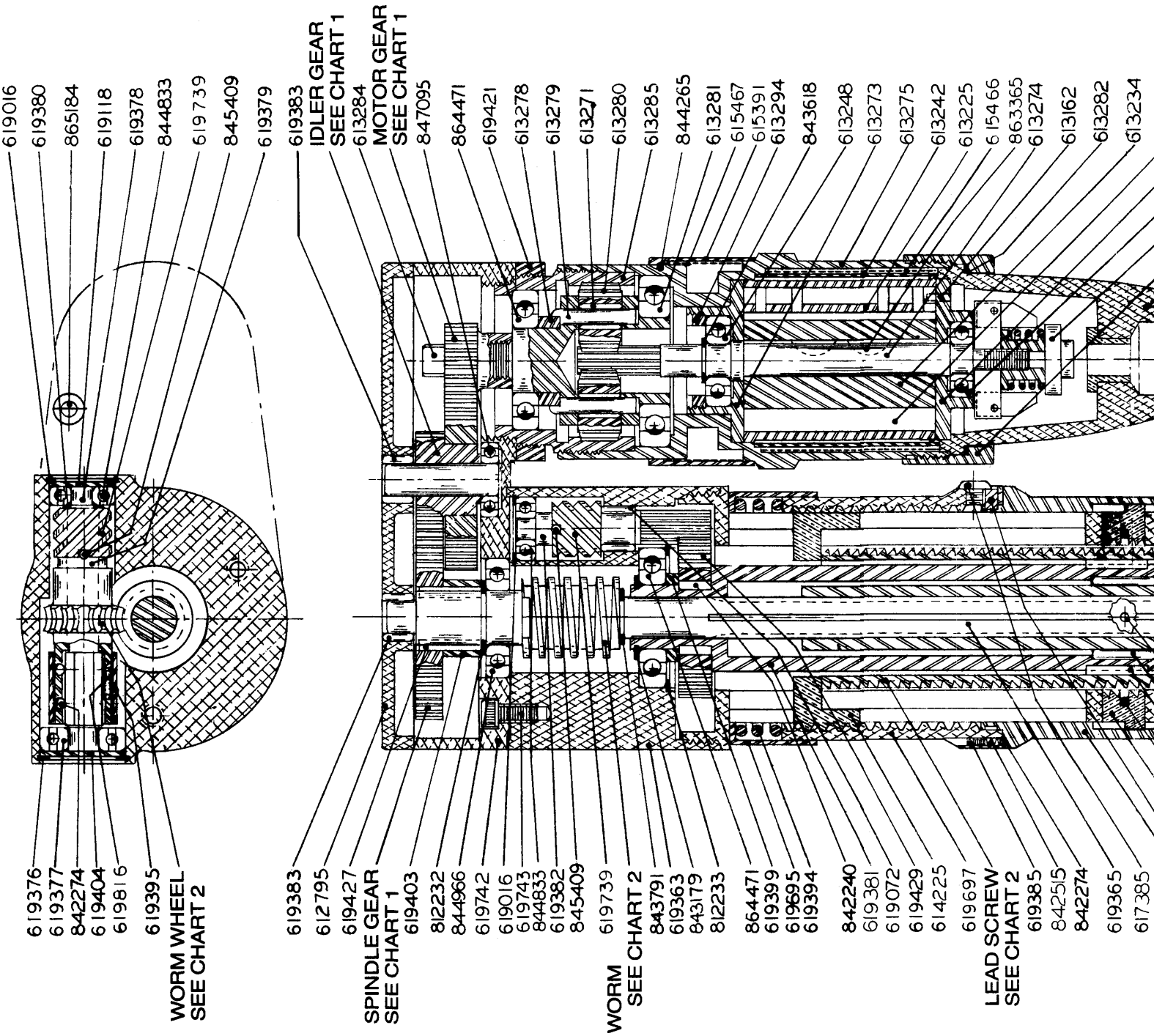
To disassemble the handle, remove the No. 812231 snap ring and gently push the throttle valve out of the bushing. Unscrew the swivel nut for cleaning and inspection of the screen.

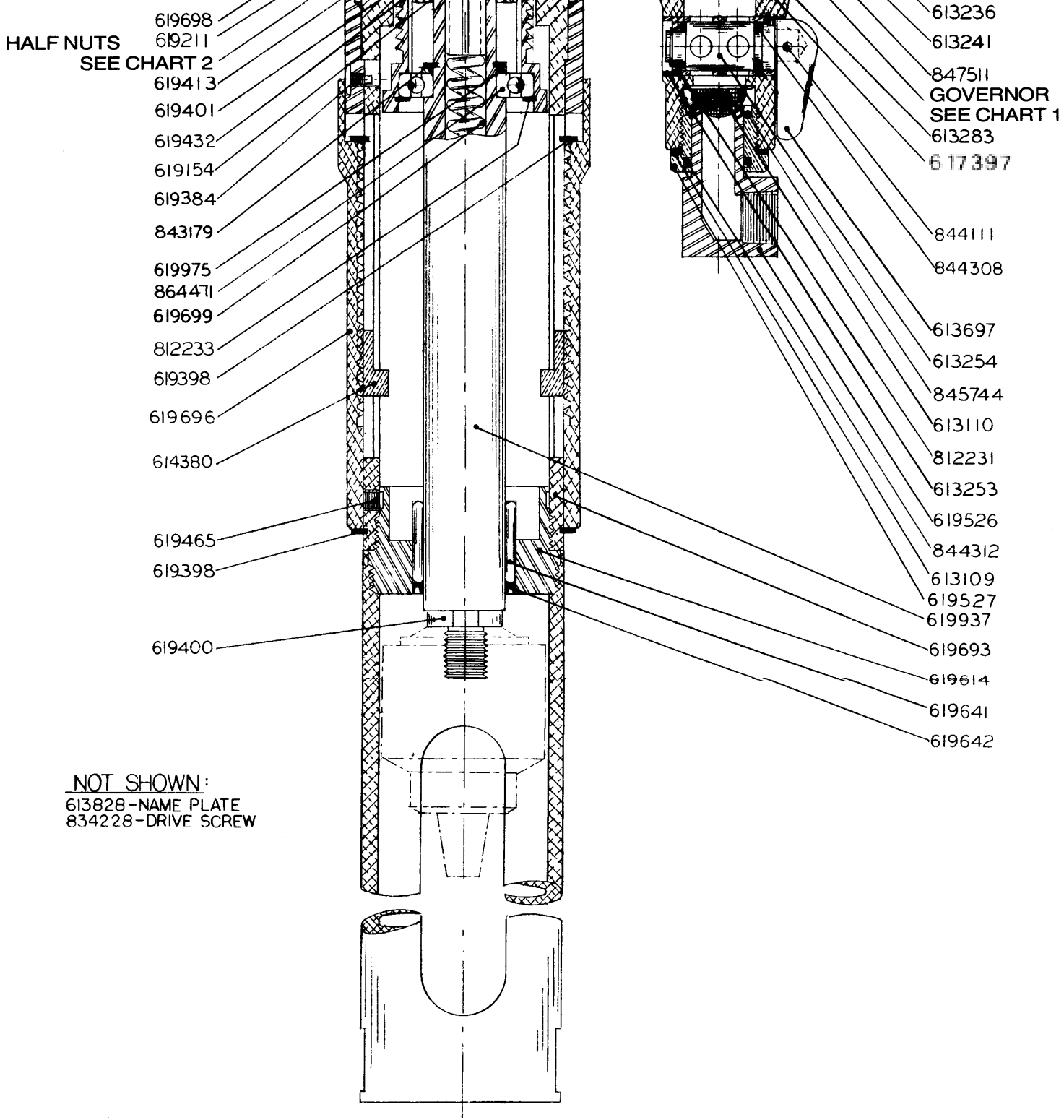
REASSEMBLY

The tool is reassembled in the reverse order of disassembly. Wash all parts thoroughly in the solvent and inspect for wear or damage before reassembly. During reassembly all parts should receive a generous coating of NLGI 2-EP Grease. If rotor blades are worn as much as 1/16" below the rotor surface, they should be replaced. NOTE: The beveled edge of the blade is trailing edge. The rotor No. 613234 and the cylinder No. 613225 should have the "L" to the rear to insure correct rotation. As the internal gear and components are assembled. The tang end of the planet pins must be toward the front of the planet cage so that the planet cage washer will lock them in place. NOTE: During reassembly of the cross shaft, hold the cross shaft with the wheel to the right and press the clutch spring No. 619395 over the hub of the worm wheel, engaging the larger steel balls with the holes in the clutch spring. NOTE: The clutch spring must wrap on the hub away from you with respect to the holes in the spring. CAUTION: wrapping the spring in the opposite direction will decrease the holding power of the clutch. The cavities in and around the lead screw driver should be packed with "Lubriplate #907" grease to aid in cushioning the return cycle.

After installing the ball bearing No. 864471 into the bore of gear body, install the snap ring No. 812233 with the open section facing the pinion No. 619382 for clearance of the pinion. After the tool is assembled, place a few drops of 10W machine oil in the air inlet before attaching the air hose. This will insure immediate lubrication of all parts as soon as the air is applied.

158QGDB - S400 BACK SPOT FACER





NOT SHOWN:
613828-NAME PLATE
834228-DRIVE SCREW

158QGDB - S400 BACK SPOT FACER

PART NO.	NAME OF PART	QTY.
611236*	Governor - Chart 1	1
611237*	Governor - Chart 1	1
611238*	Governor - Chart 1	1
611239*	Governor - Chart 1	1
611240*	Governor - Chart 1	1
613048	Spring	1
613109	Gasket	1
613110	Screen	1
613162	Cylinder Pin	1
613225	Cylinder	1
613234	Rotor	1
613236	Rotor Blade	4
613241	Rear Bearing Plate	1
613242	Sleeve	1
613248	Front Rotor Bearing	1
613253	Throttle Valve Washer	1
613254†	Throttle Valve	1
613271	Planet Gear Bearing	6
613273	Front Bearing Plate	1
613274	Rotor Shaft	1
613275	Motor Housing	1
613276	Exhaust Deflector	1
613278	Planet Cage Washer	1
613279	Planet Gear Pin	3
613280	Planet Gear	3
613281	Planet Cage Bearing	1
613282	Clamp Ring	1
613283	Handle Nut	1
613284	Planet Cage	1
613285	Internal Gear	1
613294	Rotor Bearing Retainer	1
613312	Grease Fitting	1
613697	Trigger	1
617397	Backhead	1
619016	Snap Ring	2
619072	Pinion Shaft Bearing	1
619118	Plug	1
619359	Nose - (1/22 L.H. TH'D)	1
619360	Nose - (1/4 2 L.H. TH'D)	1
619363	Gear Body	1
619365	Drive Shaft	1
619367	Worm - Chart 2	1
619368	Worm Wheel - Chart 2	1
619369	Worm - Chart 2	1
619370	Worm Wheel - Chart 2	1
619371	Worm - Chart 2	1
619372	Worm Wheel - Chart 2	1
619373	Worm - Chart 2	1
619374	Worn Wheel - Chart 2	1
619376	Plug Snap Ring	1
619377	Cross Shaft Bearing	1
619378	Cross Shaft	1
619379	Thrust Washer	1
619380	Spacer	1
619382	Pinion & Shaft	1
619383	Needle Bearing	2
619384	Screw	1
619385	Set Screw	1
619387	Return Stop (Matched Pair)	1
619392	Gear Shaft	1
619394	Spring	1
619395	Clutch Spring	1
619397	Nose - (1/4 L.H. TH'D)	1
619398	Snap Ring	2
619399	Spacer	1
619400	Spindle Adaptor	1
619401	Driver Key	2
619402	Nose - (26 L.H. TH'D)	1
619403	Gear Spacer	1
619404	Plug	1
619408	Half Nut (Matched Pair)	1
619413	Half Nut Spring	1
619415	Gear Cover	1
619418	Feed Stop (Matched Pair)	1
619421	Lock Nut	1
619427	Spindle Gear Key	2
619429	Lead Screw Driver Gear	1
619431	Set Screw	2
619432	Driver Needle Bearing	1
619434	Motor Gear - Chart 1	1
619436	Spindle Gear - Chart 1	1
619438	Spindle Gear - Chart 1	1
619439	Idler Gear - Chart 1	1
619464	Nose Adaptor	1
619465	Set Screw	1
619526	Swivel	1
619527	Swivel Bushing	1
619603	Idler Gear - Chart 1	1
619604	Motor Gear - Chart 1	1
619614	Bearing Retainer	1
619626	Worm - Chart 2	1
619627	Worm Wheel - Chart 2	1
619641	Needle Bearing	1
619642	Grease Seal	3
619693	Shaft Housing	3
619694	Lead Screw	1
619695	Spring Cover	1
619696	Retract Stop Collar	1
619697	Stop Collar	1
619698	Feed Collar	1
619699	Spindle Spring	1
619739	Helical Gear	2
619742	Gear Housing	1
619743	Bolt	3
619937	Extension Spindle	1
619975	Spacer	1
812231	Throttle Valve Snap Ring	1
812232	Drive Shaft Bearing Snap Ring	1
812233	Snap Ring	1
842240	Driver Gear Key	1
842274	Steel Ball (5/32")	1
843179	Snap Ring	2
843280	Trigger Pin	2
843618	Rotor Bearing Snap Ring	3
843791	Worm Snap Ring	2
844135	Stop Pin	1
844265	Steel Ball (1/8")	6
844308	"O"-Ring 3/8" x 9/16"	2
844312	"O"-Ring 5/8" x 13/16"	1
844833	Ball Bearing	2
844966	Drive Shaft Bearing	1
845409	Pin	1
845744	Swivel Retainer	1
847095	Gear Shaft Bearing	1
847511	Rear Rotor Bearing	2
849415	1/2" Capacity Chuck	1
863365	Rotor Shaft Key	2
864471	Ball Bearing	3
865184	Screw	2

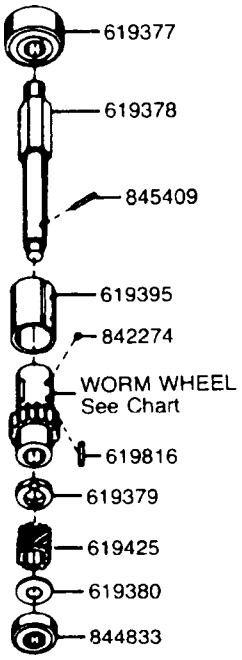
611157	**SUBASSEMBLIES** 3/4" Swivel Assembly (Part Nos. 619526 619527 - 844312 - 845744)	

NOTE: 613254† includes 844135

* Governors may be ordered as subassemblies only.

SPINDLE SPEEDS — CHART 1

R.P.M.	GOVERNOR	MOTOR GEAR	IDLER GEAR (inc's gear pin)	SPINDLE gear	POWER UNITS
3440	611236	619604	619603	619436	611692
2870	611237				611693
2100	611238	POWER UNIT	25T	SPACER 619403-0	611694
1740	611239				611695
1460	611240	30T	40T	25T	611696
1100	611236	619434	619439	619436	611692
900	611237				611693
660	611238	POWER UNIT	40T	25T	611694
540	611239			SPACER 619403-0	611695
450	611240	15T	20T		611696
640	611236	619434	619961	619960	611692
535	611237				611693
400	611238	POWER UNIT	40T	SPACER 619403-0	611694
320	611239				611695
265	611240	15T	32T	33T	611696
310	611236	619434	619439	619438	611692
250	611237				611693
185	611238	POWER UNIT	40T	SPACER 619403-0	611694
150	611239				611695
125	611240	15T	20T	45T	611696
135	611236	617567	617557	617563	621464
110	611237				621463
95	611238	POWER UNIT			621462
80	611239				621461
55	611240	12T	32T	20T	621460



SPINDLE FEEDS — CHART 2

FEED	WORM	WORM WHEEL	LEAD SCREW	HALF NUTS	CROSS SHAFT SUB-ASSEMBLY
.0005	619626	619627	627702	619516	611163*
.001	619626	619627	619694	619408	611163*
.002	619367	619368	619694	619408	611148*
.003	619371	619372	619694	619516	611150*
.004	619369	619370	619694	619408	611149*
006	619371	619372	619696	619408	611150*
.008	619373	619374	619694	619408	611151*

*All parts shown are included in the subassembly.

NOTES

NOTES

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